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(54) Title: FABRIC CARE COMPOSITION

(57) Abstract

Fabric care compositions comprising at least one amine– or amide–epichlorohydrin resin or derivate thereof and at least one textile compatible carrier, wherein the textile compatible carrier facilitates contact between the resin and a fabric, may be used in a laundering process to improve fabric dimensional stability of a fabric comprising cellulosic fibres. The fabric may contain cotton.

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FABRIC CARE COMPOSITION

Technical Field

This invention relates to fabric care compositions and, in particular, to the use of the fabric care compositions in a domestic laundering process to improve fabric dimensional stability.

Background and Prior Art

The laundry process generally has several benefits for fabric, the most common being to remove dirt and stains from the fabric during the wash cycle and to soften the fabric during the rinse cycle. However, there are numerous disadvantages associated with repeated use of conventional laundry treatment compositions and/or the actual laundry process; one of these being a fairly harsh treatment of fabric in the laundry process.

Fabrics can be damaged in several ways as a result of repeated laundering and/or wear. Fabric pilling and loss of fabric surface appearance e.g. fuzzing, shrinkage (or expansion), loss of colour from the fabric or running of colour on the fabric (usually termed dye transfer) are some of the common problems associated with repeated laundering. These problems may occur merely from repeated hand washing as well as the more vigorous machine washing process. Furthermore, problems relating to damage of fabric over time through normal use, such as loss of shape and increased likelihood of wrinkling are also significant.

The present invention is directed towards alleviating one or more of the problems referred to hereinabove.

The principal advantage of the present invention relates to maintaining the dimensional stability of the fabric.

Laundry detergent compositions containing polyamide-polyamine fabric treatment agents are described in WO 98/29530. The compositions are claimed to impart improved overall appearance to fabrics laundered using the detergent compositions, in terms of surface appearance properties such as pill/fuzz reduction and antifading. Laundry compositions containing polyamide-polyamine treatment agents of similar types are taught in WO 97/42287.

WO 96/15309 and WO 96/15310 describe anti-wrinkle compositions which contain a silicone and a film-forming polymer. A wide range of possibilities is given for the film-forming polymer.

An industrial process for treating fibres is disclosed in US 3949014. This document describes the use of a polyamine-epichlorohydrin resin in a binder, together with an amphoteric high molecular weight compound having at least 2 cationic groups and at least 2 anionic groups per molecule. US 3949014 mentions the treatment of fabrics with the binder but it is clear that the treatment is intended to be carried out industrially as part of a fabric treatment process rather than as part of a domestic laundering process and this conclusion is supported by the fact that the fabric treated with the binder required curing at a

relatively high temperature. Industrial curing of fabrics treated with this type of polymer system is normally carried out at about 150°C.

Methods for treating wool with compositions containing an amino functional polymer and a silicone polymer so as to impart shink resistance are known. However, as described in EP-A-0315477, wool requires a pretreatment before such compositions can be used. Furthermore, EP-A-0372782 explains that the chemistry of wool is quite different from that of cellulosic fibres such as cotton and the requirements for shrink resistance treatments for cotton are generally very different from those for wool.

US 4371517 discloses compositions for treating fibrous materials which contain cationic and anionic polymers. In a non-domestic treatment, the compositions increased the rigidity of cotton fabric.

Co-emulsifiers, for use in fabric softener and other compositions, which contain cationic quaternary amine polymers, are taught in DD 221922.

The present invention is based on the surprising finding of a method for alleviating the dimensional instability (eg shrinkage) of fabrics which comprise cellulosic fibres such as cotton, for example. The term "dimensional stability", and related terms, used herein covers not only shrinkage of fabrics but also shape retention, bagginess reduction and additionally, although less preferred, crease/wrinkle resistance in fabrics.

Definition of the Invention

According to the present invention, there is provided the use of a fabric care composition comprising at least one amine- or amide-epichlorohydrin resin or derivative thereof and at least one textile compatible carrier, wherein the textile compatible carrier facilitates contact between the resin and a fabric, in a laundering process to improve fabric dimensional stability of a fabric comprising cellulosic fibres.

The invention also provides a method of treating fabric to improve its dimensional stability comprising applying to the fabric a composition comprising at least one amine- or amide-epichlorohydrin resin or derivative thereof and a textile compatible carrier, wherein the textile compatible carrier facilitates contact between the resin and the fabric, as part of a laundering process.

Detailed Description of the Invention

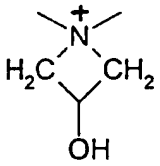
The compositions of the present invention comprise, as the first component, at least one amine- or amide- epichlorohydrin resin or derivatives thereof.

In the context of the present invention these first materials are polymeric, or at least oligomeric, in nature. Preferably, they have a weight average mean molecular weight of from 300 to 1,000,000 daltons.

The resins of the invention are sometimes referred to below as amine-epichlorohydrin resins and polyamine-epichlorohydrin (PAE) resins (the two

terms being used synonymously) although these terms encompass both the amine and amide resins of the invention. The resins may also have a mixture of amine and amide groups.

The amine or amide-epichlorohydrin resins may have one or more functional groups capable of forming azetidinium groups and/or one or more azetidinium functional groups.



Alternatively, or additionally the resins may have one or more functional groups that contain epoxide groups or derivatives thereof e.g. Kymene 450™ (ex Hercules).

Suitable polyamine-epichlorohydrin (PAE) resins include those described in 'Wet Strength Resins and Their Application', pp 16-36, ed. L.L.Chan, Tappi Press, Atlanta, 1994. Suitable PAE resins can be identified by selecting those resins which impart increased wet strength to paper, after treatment, in a relatively simple test.

Any amine or amide-epichlorohydrin resin having an epoxide functional group or derivative thereof is suitable for use according to the invention.

A particularly preferred class of amine or amide-epichlorohydrin resins for use in the invention are secondary amine or amide-based azetidinium resins, for

example, those resins derived from a polyalkylene polyamine e.g. diethylenetriamine (DETA), a polycarboxylic acid e.g. adipic acid or other dicarboxylic acids, and epichlorohydrin. Other polyamines or polyamides can also be advantageously used in the preparation of suitable PAE resins.

Another preferred class of amine-epichlorohydrin resins for use in the invention are those having an epoxide functional group or derivative thereof e.g. chlorohydrin..

The resin is preferably present in the product in a sufficient quantity to give an amount of 0.0005% to 5% by weight on the fabric based on the weight of the fabric, more preferably 0.001% to 2% by weight on fabric. The amount of the first component in the composition required to achieve the above % by weight on fabric will typically be in the range 0.01% to 35% by weight, preferably 0.1 to 13.5% by weight.

The resins may be PDAA-epichlorohydrin resins or PMDAA-epichlorohydrin resins. PDAA is poly(diallylamine) and PMDAA is poly(methyldiallyl(amine)).

The compositions of the invention, when applied to a fabric, can impart benefits to the fabric when uncured. However, they may be cured by a domestic curing step including ironing and/or domestic tumble drying, preferably tumble drying. The curing is preferably carried out at a temperature in the range of from 50 to 100°C, more preferably from 80 to 100°C.

The composition of the invention may further comprise a silicone component. It is preferred if the silicone component is a dimethylpolysiloxane with amino alkyl groups. It may be used in the context of the present invention as an emulsion in water.

It is preferred if the silicone component is present in a ratio of first component: silicone of from 1:1 to 30:1, preferably 1:1 to 20:1, more preferably 2:1 to 20:1 and most preferably 5:1 to 15:1.

In the context of the present invention the term "textile compatible carrier" is a component which can assist in the interaction of the first component with the fabric. The carrier can also provide benefits in addition to those provided by the first component e.g. softening, cleaning etc. The carrier may be a water or a detergent-active compound or a fabric softener or conditioning compound or other suitable detergent or fabric treatment agent.

If the composition of the invention is to be used in a laundry process as part of a conventional fabric treatment product, such as a detergent composition, the textile-compatible carrier will typically be a detergent-active compound. Whereas, if the fabric treatment product is a rinse conditioner, the textile-compatible carrier will be a fabric softening and/or conditioning compound.

If the composition of the invention is to be used before, or after, the laundry process it may be in the form of a spray or foaming product.

The fabrics which may be treated in the present invention comprise cellulosic fibres, preferably from 1% to 100% cellulosic fibres (more preferably 5% to 100% cellulosic fibres, most preferably 40% to 100%). When the fabric contains less than 100% cellulosic fibres, the balance comprises other fibres or blends of fibres suitable for use in garments such as polyester, for example. Preferably, the cellulosic fibres are of cotton or regenerated cellulose such as viscose.

The laundering processes of the present invention include the large scale and small scale (eg domestic) cleaning of fabrics. Preferably, the processes are domestic.

In the invention, the resin is preferably used to treat the fabric in the rinse cycle of a laundering process. The rinse cycle preferably follows the treatment of the fabric with a detergent composition.

Detergent Active Compounds

If the composition of the present invention is in the form of a detergent composition, the textile-compatible carrier may be chosen from soap and non-soap anionic, cationic, nonionic, amphoteric and zwitterionic detergent active compounds, and mixtures thereof.

Many suitable detergent active compounds are available and are fully described in the literature, for example, in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

The preferred textile-compatible carriers that can be used are soaps and synthetic non-soap anionic and nonionic compounds.

Anionic surfactants are well-known to those skilled in the art. Examples include alkylbenzene sulphonates, particularly linear alkylbenzene sulphonates having an alkyl chain length of C_8-C_{15}; primary and secondary alkylsulphates, particularly C_8-C_{15} primary alkyl sulphates; alkyl ether sulphates; olefin sulphonates; alkyl xylene sulphonates; dialkyl sulphosuccinates; and fatty acid ester sulphonates. Sodium salts are generally preferred.

Nonionic surfactants that may be used include the primary and secondary alcohol ethoxylates, especially the C_8-C_{20} aliphatic alcohols ethoxylated with an average of from 1 to 20 moles of ethylene oxide per mole of alcohol, and more especially the C_{10}-C_{15} primary and secondary aliphatic alcohols ethoxylated with an average of from 1 to 10 moles of ethylene oxide per mole of alcohol. Non-ethoxylated nonionic surfactants include alkylpolyglycosides, glycerol monoethers, and polyhydroxyamides (glucamide).

Cationic surfactants that may be used include quaternary ammonium salts of the general formula $R_1R_2R_3R_4N^+ X^-$ wherein the R groups are independently hydrocarbyl chains of C_1-C_{22} length, typically alkyl, hydroxyalkyl or ethoxylated alkyl groups, and X is a solubilising cation (for example, compounds in which R_1 is a C_8-C_{22} alkyl group, preferably a C_8-C_{10} or C_{12}-C_{14} alkyl group, R_2 is a methyl group, and R_3 and R_4, which may be the same or different, are methyl or hydroxyethyl groups); and cationic esters (for example, choline esters) and pyridinium salts.

The total quantity of detergent surfactant in the composition is suitably from 0.1 to 60 wt% e.g. 0.5-55 wt%, such as 5-50wt%.

Preferably, the quantity of anionic surfactant (when present) is in the range of from 1 to 50% by weight of the total composition. More preferably, the quantity of anionic surfactant is in the range of from 3 to 35% by weight, e.g. 5 to 30% by weight.

Preferably, the quantity of nonionic surfactant when present is in the range of from 2 to 25% by weight, more preferably from 5 to 20% by weight.

Amphoteric surfactants may also be used, for example amine oxides or betaines.

The compositions may suitably contain from 10 to 70%, preferably from 15 to 70% by weight, of detergency builder. Preferably, the quantity of builder is in the range of from 15 to 50% by weight.

The detergent composition may contain as builder a crystalline aluminosilicate, preferably an alkali metal aluminosilicate, more preferably a sodium aluminosilicate.

The aluminosilicate may generally be incorporated in amounts of from 10 to 70% by weight (anhydrous basis), preferably from 25 to 50%. Aluminosilicates are materials having the general formula:

$0.8\text{-}1.5\ M_2O.\ Al_2O_3.\ 0.8\text{-}6\ SiO_2$

where M is a monovalent cation, preferably sodium. These materials contain some bound water and are required to have a calcium ion exchange capacity of at least 50 mg CaO/g. The preferred sodium aluminosilicates contain 1.5-3.5 SiO_2 units in the formula above. They can be prepared readily by reaction between sodium silicate and sodium aluminate, as amply described in the literature.

Fabric Softening and/or Conditioner Compounds

If the composition of the present invention is in the form of a fabric conditioner composition, the textile-compatible carrier will be a fabric softening and/or conditioning compound (hereinafter referred to as "fabric softening compound"), which may be a cationic or nonionic compound.

The softening and/or conditioning compounds may be water insoluble quaternary ammonium compounds. The compounds may be present in amounts of up to 8% by weight (based on the total amount of the composition) in which case the compositions are considered dilute, or at levels from 8% to about 50% by weight, in which case the compositions are considered concentrates.

Compositions suitable for delivery during the rinse cycle may also be delivered to the fabric in the tumble dryer if used in a suitable form. Thus, another product form is a composition (for example, a paste) suitable for coating onto, and delivery from, a substrate e.g. a flexible sheet or sponge or a suitable dispenser during a tumble dryer cycle.

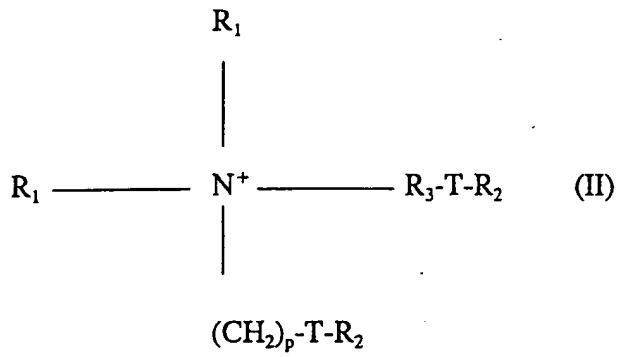
Suitable cationic fabric softening compounds are substantially water-insoluble quaternary ammonium materials comprising a single alkyl or alkenyl long chain having an average chain length greater than or equal to C_{20} or, more preferably, compounds comprising a polar head group and two alkyl or alkenyl chains having an average chain length greater than or equal to C_{14}. Preferably the fabric softening compounds have two long chain alkyl or alkenyl chains each having an average chain length greater than or equal to C_{16}. Most preferably at least 50% of the long chain alkyl or alkenyl groups have a chain length of C_{18} or above. It is preferred if the long chain alkyl or alkenyl groups of the fabric softening compound are predominantly linear.

Quaternary ammonium compounds having two long-chain aliphatic groups, for example, distearyldimethyl ammonium chloride and di(hardened tallow alkyl) dimethyl ammonium chloride, are widely used in commercially available rinse conditioner compositions. Other examples of these cationic compounds are to be found in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch. Any of the conventional types of such compounds may be used in the compositions of the present invention.

The fabric softening compounds are preferably compounds that provide excellent softening, and are characterised by a chain melting Lβ to Lα transition temperature greater than 25°C, preferably greater than 35°C, most preferably greater than 45°C. This Lβ to Lα transition can be measured by DSC as defined in "Handbook of Lipid Bilayers", D Marsh, CRC Press, Boca Raton, Florida, 1990 (pages 137 and 337).

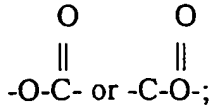
Substantially water-insoluble fabric softening compounds are defined as fabric softening compounds having a solubility of less than 1×10^{-3} wt % in demineralised water at 20°C. Preferably the fabric softening compounds have a solubility of less than 1×10^{-4} wt%, more preferably less than 1×10^{-8} to 1×10^{-6} wt%.

Especially preferred are cationic fabric softening compounds that are water-insoluble quaternary ammonium materials having two C_{12-22} alkyl or alkenyl groups connected to the molecule via at least one ester link, preferably two ester links. An especially preferred ester-linked quaternary ammonium material can be represented by the formula II:



(II)

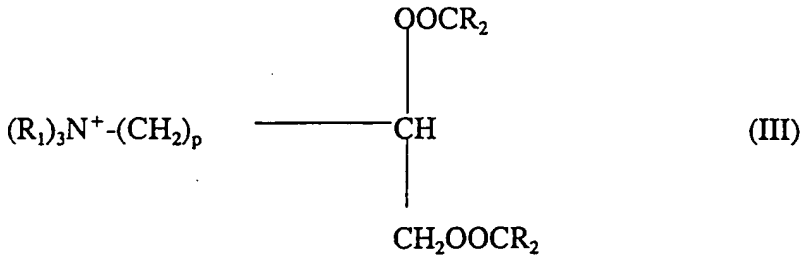
wherein each R_1 group is independently selected from C_{1-4} alkyl or hydroxyalkyl groups or C_{2-4} alkenyl groups; each R_2 group is independently selected from C_{8-28} alkyl or alkenyl groups; and wherein R_3 is a linear or branched alkylene group of 1 to 5 carbon atoms, T is



and p is 0 or is an integer from 1 to 5.

Di(tallowoxyloxyethyl) dimethyl ammonium chloride and/or its hardened tallow analogue is especially preferred of the compounds of formula (II).

A second preferred type of quaternary ammonium material can be represented by the formula (III):



(III)

wherein R_1, p and R_2 are as defined above.

It is advantageous if the quaternary ammonium material is biologically biodegradable.

Preferred materials of this class such as 1,2-bis(hardened tallowoyloxy)-3-trimethylammonium propane chloride and their methods of preparation are, for example, described in US 4 137 180 (Lever Brothers Co). Preferably these materials comprise small amounts of the corresponding monoester as described in US 4 137 180, for example, 1-hardened tallowoyloxy-2-hydroxy-3-trimethylammonium propane chloride.

Other useful cationic softening agents are alkyl pyridinium salts and substituted imidazoline species. Also useful are primary, secondary and tertiary amines and the condensation products of fatty acids with alkylpolyamines.

The compositions may alternatively or additionally contain water-soluble cationic fabric softeners, as described in GB 2 039 556B (Unilever).

The compositions may comprise a cationic fabric softening compound and an oil, for example as disclosed in EP-A-0829531.

The compositions may alternatively or additionally contain nonionic fabric softening agents such as lanolin and derivatives thereof.

Lecithins are also suitable softening compounds.

Nonionic softeners include Lβ phase forming sugar esters (as described in M Hato et al Langmuir 12, 1659, 1666, (1996)) and related materials such as glycerol monostearate or sorbitan esters. Often these materials are used in conjunction with cationic materials to assist deposition (see, for example, GB 2 202 244). Silicones are used in a similar way as a co-softener with a cationic softener in rinse treatments (see, for example, GB 1 549 180).

The compositions may also suitably contain a nonionic stabilising agent. Suitable nonionic stabilising agents are linear C_8 to C_{22} alcohols alkoxylated with 10 to 20 moles of alkylene oxide, C_{10} to C_{20} alcohols, or mixtures thereof. Advantageously the nonionic stabilising agent is a linear C_8 to C_{22} alcohol alkoxylated with 10 to 20 moles of alkylene oxide. Preferably, the level of

nonionic stabiliser is within the range from 0.1 to 10% by weight, more preferably from 0.5 to 5% by weight, most preferably from 1 to 4% by weight. The mole ratio of the quaternary ammonium compound and/or other cationic softening agent to the nonionic stabilising agent is suitably within the range from 40:1 to about 1:1, preferably within the range from 18:1 to about 3:1.

The composition can also contain fatty acids, for example C_8 to C_{24} alkyl or alkenyl monocarboxylic acids or polymers thereof. Preferably saturated fatty acids are used, in particular, hardened tallow C_{16} to C_{18} fatty acids. Preferably the fatty acid is non-saponified, more preferably the fatty acid is free, for example oleic acid, lauric acid or tallow fatty acid. The level of fatty acid material is preferably more than 0.1% by weight, more preferably more than 0.2% by weight. Concentrated compositions may comprise from 0.5 to 20% by weight of fatty acid, more preferably 1% to 10% by weight. The weight ratio of quaternary ammonium material or other cationic softening agent to fatty acid material is preferably from 10:1 to 1:10.

The fabric conditioning compositions may include silicones, such as predominately linear polydialkylsiloxanes, e.g. polydimethylsiloxanes or aminosilicones containing amine-functionalised side chains; soil release polymers such as block copolymers of polyethylene oxide and terephthalate; amphoteric surfactants; smectite type inorganic clays; zwitterionic quaternary ammonium compounds; and nonionic surfactants.

The fabric conditioning compositions may also include an agent which produces a pearlescent appearance, e.g. an organic pearlising compound such as ethylene

glycol distearate, or inorganic pearlising pigments such as microfine mica or titanium dioxide (TiO_2) coated mica.

The fabric conditioning compositions may be in the form of emulsions or emulsion precursors thereof.

Other optional ingredients include emulsifiers, electrolytes (for example, sodium chloride or calcium chloride) preferably in the range from 0.01 to 5% by weight, pH buffering agents, and perfumes (preferably from 0.1 to 5% by weight).

Further optional ingredients include non-aqueous solvents, perfume carriers, fluorescers, colourants, hydrotropes, antifoaming agents, antiredeposition agents, enzymes, optical brightening agents, opacifiers, dye transfer inhibitors, anti-shrinking agents, anti-wrinkle agents, anti-spotting agents, germicides, fungicides, anti-oxidants, UV absorbers (sunscreens), heavy metal sequestrants, chlorine scavengers, dye fixatives, anti-corrosion agents, drape imparting agents, antistatic agents and ironing aids. This list is not intended to be exhaustive.

Fabric Treatment Products

The composition of the invention may be in the form of a liquid, solid (e.g. powder or tablet), a gel or paste, spray, stick or a foam or mousse. Examples including a soaking product, a rinse treatment (e.g. conditioner or finisher) or a mainwash product. The composition may also be applied to a substrate e.g. a flexible sheet or used in a dispenser which can be used in the wash cycle, rinse cycle or during the dryer cycle.

The invention will now be described by way of example only and with reference to the following non-limiting examples.

EXAMPLES

Experimental Procedure to show effect on dimensional stability

Experimental Procedure

The amine epichlorohydrin resin used in the following tests is Apomul SAK, (ex. Brookstone Chemicals) which has an azetidinum functional group. It was prepared as an aqueous solution and utilised as a percentage of the weight of fabric treated (% on weight of fabric (owf)) to show its effect on fabric dimensional stability.

Two types of fabric, cotton interlock and cotton poplin, were used in the procedure below. Each fabric was tested in the weft and warp direction, figures relating to the % dimensional change (by multiplying the % change in the weft direction by the % change in the warp direction) have been tabulated.

All fabrics pieces were pre-washed prior to treating (40°C cotton wash in a Miele Novotronic W820 Front Loading Washing Machine, Wirral water, 100g Persil non biological washing powder, then tumble dried in a Miele Novotronic T430 Tumble Dryer). The fabrics pieces were then marked up using the M&S Shrinkage Rule and labelled. Four pieces of each fabric type plus clean cotton sheeting made up a 2.5kg load, which was washed (40°C cotton wash in a Miele

Novotronic W820 Front Loading Washing Machine, Wirral water, 100g Persil non biological washing powder added in the main wash. Apomul SAK was added in the final rinse), then tumble dried in a Miele Novotronic T430 Tumble Dryer, and finally lightly ironed on both sides (cotton setting). Ironing only took place after the first wash. The fabric pieces were then conditioned for 24 hours at 65% RH, 20°C. The washing and drying stages were repeated until five washes were completed.

EXAMPLE 1

The % dimensional change results are given in the tables below. % dimensional change was calculated by multiplying the mean warp % values by the mean weft % values, i.e. the mean value is calculated from the values obtained before and after each test.

Dose Response - Tumble Drying

Cotton Interlock Fabric - % Dimensional Change

Wash Number	Water Control	SAK (0.054% owf)	SAK (0.135% owf)	SAK (0.27% owf)	SAK (0.54% owf)
1	1.97	13.51	7.49	1.21	7.49
2	12.10	4.04	2.90	3.40	1.73
3	13.83	5.58	2.83	5.65	1.80
4	29.28	5.67	0.77	7.15	0.21
5	24.36	12.46	8.71	12.27	3.89

Cotton Poplin Fabric - % Dimensional Change

Wash Number	Water Control	SAK (0.054% owf)	SAK (0.135% owf)	SAK (0.27% owf)	SAK (0.54% owf)
1	0.22	0.056	0.096	0.18	0.14
2	1.11	0.70	0.20	0.31	0.19
3	1.37	1.98	0.99	0.33	1.28
4	2.10	2.28	1.23	0.37	0.75
5	3.60	3.04	1.51	1.11	1.20

Clearly, the results show that addition of Apomul SAK stabilises the fabric to reduce the loss of shape which usually occurs after repeated washing.

EXAMPLE 2

Percentage dimensional change in using Apomul SAK in combination with a silicone component.

The same experimental procedure as outlined for test 1 was followed, the treatment product being altered by the addition of a silicone component CT45E from Wacker.

The % dimensional change results are given in the tables below. % dimensional change was calculated as described above.

Cotton Interlock - % Dimensional Change

Wash Number	Water Control	SAK (0.27% owf)	15:1 by wt SAK/CT45E (0.047% owf)	10:1 by wt SAK/CT45E (0.07% owf)	5:1 by wt SAK/CT45E (0.14% owf)
1	1.97	1.21	0.43	2.64	1.40
2	12.10	3.40	0.68	1.38	0.086
3	13.83	5.65	0.75	2.51	1.29
4	29.28	7.15	0.42	1.66	0.45
5	24.36	12.27	2.02	3.70	1.47

The results again demonstrate the improvement in dimensional stability achieved by the use of Apomul SAK this time in combination with the silicone.

Cotton Poplin - % Dimensional Change

Wash Number	Water Control	SAK (0.27% owf)	15:1 by wt SAK/CT45E (0.047% owf)	10:1 by wt SAK/CT45E (0.07% owf)	5:1 by wt SAK/CT45E (0.14% owf)
1	0.22	0.18	0.32	0.24	0.04
2	1.11	0.31	0.17	0.47	0.14
3	1.37	0.33	0.41	0.75	0.50
4	2.10	0.37	1.16	0.56	0.41
5	3.60	1.11	0.65	1.01	0.72

The results again demonstrate the improvement in dimensional stability achieved by the use of Apomul SAK this time in combination with the silicone.

CLAIMS

1. Use of a fabric care composition comprising at least one amine- or amide-epichlorohydrin resin or derivative thereof and at least one textile compatible carrier, wherein the textile compatible carrier facilitates contact between the resin and a fabric, in a laundering process to improve fabric dimensional stability of a fabric comprising cellulosic fibres.

2. Use as claimed in Claim 1, wherein the amine or amide-epichlorohydrin resin has one or more functional groups capable of forming azetidinium groups.

3. Use according to claim 2, wherein the amine or amide-epichlorohydrin resin has one or more azetidinium functional groups.

4. Use according to claim 1 wherein the amine or amide epichlorohydrin resin or derivative thereof has one or more functional groups that contain epoxide groups or derivatives thereof.

5. Use according to any one of the preceding claims in which the composition further comprises a silicone component.

6. Use according to any one of the preceding claims wherein an amine or amide-epichlorohydrin or derivative thereof is present in the composition in an amount such that from 0.0005% to 5% by weight on weight of fabric is provided.

7. Use according to either claim 5 or claim 6, wherein the ratio of the resin to silicone component is from 1:1 to 30:1, preferably 1:1 to 20:1 and most preferably 5:1 to 15:1.

8. Use as claimed in any one of Claims 1 to 7, wherein the fabric comprises cotton or regenerated cellulose.

9. Use as claimed in any one of Claims 1 to 8, wherein the composition comprises a detergent active compound.

10. Use as claimed in any one of Claims 1 to 8, wherein the composition comprises a fabric softening and/or conditioning compound.

11. A method of treating fabric to improve its dimensional stability comprising applying to the fabric a composition comprising at least one amine- or amide-epichlorohydrin resin or derivative thereof and a textile compatible carrier, wherein the textile compatible carrier facilitates contact between the resin and the fabric, as part of a laundering process.

12. Method as claimed in Claim 11, wherein the composition is applied to the fabric during the rinse cycle of the laundering process.

INTERNATIONAL SEARCH REPORT

Inter nal Application No
PCT/EP 99/06429

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C11D3/37 C11D3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	WO 96 21715 A (PROCTER & GAMBLE) 18 July 1996 (1996-07-18) page 23, line 20 - line 31; example IV ---	1-4,6, 8-12
A	GB 2 089 855 A (CIBA GEIGY AG) 30 June 1982 (1982-06-30) claims; examples ---	1-12
A	WO 98 29530 A (RANDALL SHERRI LYNN ;PANANDIKER RAJAN KEESHAV (US); PROCTER & GAMB) 9 July 1998 (1998-07-09) page 5, line 22 -page 7, line 4 page 11, last line -page 12, line 4 page 13, line 6 - line 14 claim 1; table 1 --- -/--	1

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 November 1999	06/12/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Loiselet-Taisne, S

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 99/06429

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
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